

1. A method of determining which users, from a plurality of users, access to a communications system is to be provided, such access being provided to the plurality of users over a plurality of channels, the method comprising the steps of:

determining, for each of plurality of channels and for each of the plurality of users, a channel measurement feedback characteristic;

determining, for each of the plurality of channels and for each of the plurality of users, a past throughput characteristic; and

determining, a user to be provided access according to the following relationship:

$$k^* = \arg \max_k \{w_k \frac{r_k(t)}{\tilde{r}_k(t)^\alpha}\}$$

where

$r_k(t)$ is the channel measurement feedback characteristic of user k ;

$\tilde{r}_k(t)$ is the mean throughput of user k ;

w_k is a weight applied to each of the users;

α is the *Alpha Rule* tuning parameter wherein $\alpha \neq 0$ and $\alpha \neq 1$; and

k^* is the selected user.

2. The method according to claim 1 further comprising the steps of:

determining, a throughput characteristic for the system;

determining, a fairness characteristic for the system; and

adjusting α , as a result of the determined throughput characteristic and the determined fairness characteristic.

3. The method according to claim 2 further comprising the steps of:

comparing, the determined throughput characteristic for the system with a target throughput characteristic;

comparing, the determined fairness characteristic for the system with a target fairness characteristic.

1 4. The method according to claim 3 wherein the adjusting step further comprising the
2 steps of:

3 decrementing α , by a predetermined amount, when the determined throughput
4 characteristic for the system is \leq the target throughput characteristic and the
5 determined fairness characteristic for the system is \geq the target fairness
6 characteristic.

1 5. The method according to claim 3 wherein the adjusting step further comprising the
2 steps of:

3 incrementing α , by a predetermined amount, when the determined throughput
4 characteristic for the system is \geq the target throughput characteristic and the
5 determined fairness characteristic for the system is \leq the target fairness
6 characteristic.

1 6. The method according to claim 3 wherein the adjusting step further comprising the
2 steps of:

3 adjusting the targets, by a predetermined amount, when the determined
4 throughput characteristic for the system is \leq the target throughput
5 characteristic and the determined fairness characteristic for the system is \leq
6 the target fairness characteristic.

1 7. The method according to claim 3, wherein the throughput characteristic is
2 determined according to the following relationship:

$$\tilde{R} = \sum_{k=1}^K \tilde{r}_k(t)$$

3
4 where

5 $\tilde{r}_k(t)$ is the mean throughput of user k .

1 8. The method according to claim 3, wherein the fairness characteristic is determined
2 according to the following relationship:

$$\tilde{F} = \frac{(\sum_{k=1}^K \tilde{r}_k(t))^2}{(K \sum_{k=1}^K \tilde{r}_k(t)^2)}$$

4
5 where

6 $\tilde{r}_k(t)$ is the mean throughput of user k ; and
7 K is the total number of users.

1 9. The method according to claim 4, wherein α is decremented by a percentage of its
2 present value.

1 10. The method according to claim 5, wherein α is incremented by a percentage of its
2 present value.

1 11. The method according to claim 9, wherein the percentage that α is decremented by
2 is between 0% and 100%.

1 12. The method according to claim 10, wherein the percentage that α is incremented by
2 is between 0% and 100%.

1 13. The method according to claim 2, wherein the adjusting of α is performed in real-
2 time.